



Uneven futures of human lifespans: Reckonings from Gompertz mortality rates, climate change, and air pollution

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Abstract:

The past 200 years have enabled remarkable increases in human lifespans through improvements in the living environment that have nearly eliminated infections as a cause of death through improved hygiene, public health, medicine, and nutrition. We argue that the limit to lifespan may be approaching. Since 1997, no one has exceeded Jeanne Calment's record of 122.5 years, despite an exponential increase of centenarians. Moreover, the background mortality may be approaching a lower limit. We calculate from Gompertz coefficients that further increases in longevity to approach a life expectancy of 100 years in 21st century cohorts would require 50% slower mortality rate accelerations, which would be a fundamental change in the rate of human aging. Looking into the 21st century, we see further challenges to health and longevity from the continued burning of fossil fuels that contribute to air pollution as well as global warming. Besides increased heat waves to which elderly are vulnerable, global warming is anticipated to increase ozone levels and facilitate the spread of pathogens. We anticipate continuing socioeconomic disparities in life expectancy.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Extreme Weather Event, Precipitation, Sea Level Rise, Temperature

Air Pollution: Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NOx; SO2

Temperature: Extreme Heat, Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Climate Change and Human Health Literature Portal

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Cancer, Cardiovascular Effect, Infectious Disease, Morbidity/Mortality, Neurological Effect, Respiratory Effect

Cardiovascular Effect: Heart Attack

Infectious Disease: Vectorborne Disease

Vectorborne Disease: General Vectorborne, Mosquito-borne Disease

Mosquito-borne Disease: Dengue, General Mosquito-borne Disease

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory mortality

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Elderly, Low Socioeconomic Status

Other Vulnerable Population: people with diabetes; people with congestive heart failure

Resource Type:

format or standard characteristic of resource

Policy/Opinion, Review

Timescale:

time period studied

Medium-Term (10-50 years)